

REGIONAL VARIATION IN THE NORTH AMERICAN ELEMENTS OF *OXALIS*
CORNICULATA (OXALIDACEAE)

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ABSTRACT

The native North American elements of *Oxalis corniculata* L. are treated within two infraspecific groupings: var. *pilosa* (Nutt. ex Torr. & Gray) B.L. Turner, *comb. nov.*, and var. *wrightii* (A. Gray) B.L. Turner, *comb. nov.* These appear to be the only meaningful naturally occurring populational segregates in North America, the former variety occurring mostly in the drier more elevated portions of western U.S.A., México, and Central America, the latter occurring mostly in the grassland regions of central U.S.A. from Canada to the Mexican border. A syndrome of characters serve to distinguish the taxa, for which a key is constructed and a map showing their distribution is provided.

KEY WORDS: Oxalidaceae, *Oxalis*, Texas, México

The North American yellow flowered species of *Oxalis* belonging to the section *Corniculatae* DC. (namely *O. corniculata* L. and its close relatives) are extremely difficult taxonomically and have been the subject of much discussion and nomenclatural confusion. Wiegand (1925) provided a rather detailed overview of the North American elements of the *O. corniculata* complex, recognizing in this ten species, some of these with several varieties, most of the latter lacking morphogeographic integrity. Shinnery (1956) provided a treatment of *O. dillenii* Jacq. (*sensu* Eiten 1955) for Texas. In this he recognized a needless new variety, *O. d.* var. *radicans* Shinnery, and *O. d.* var. *dillenii*. I consider both of these to be the same as my concept of *O. corniculata* var. *wrightii* (A. Gray) B.L. Turner. Shinnery also recognized a "dark green creeping plant with brownish, oblong stipules, occurs as a rather recent introduction in southern Texas ..." as *O. corniculata*, but I cannot distinguish most of the latter from *O. c.* var. *wrightii*, although I would not deny the existence of an occasional introductant of *O. c.* var. *corniculata* *sensu* Lourteig (*cf.* below).

Eiten (1963) presented a broad imaginative world-wide synthetic treatment of sect. *Corniculatae* in which its two subsections, *Strictae* Eiten and *Corniculatae*, were thought to have developed early on in Eurasia, the former migrating to North America, the latter to South America, these subsequently expanding their territories in the New World, so much so that the two sections reestablished a secondary contact in North America, presumably in México to judge from his Figure 2 showing ancestral migratory pathways in the group. In spite of its breadth and imaginative tone, Eiten (1963, p. 241) considered his taxonomic treatment to be no more than a "synopsis", providing only partial synonymy for most of the nineteen taxa (fourteen species and five subspecies) recognized. His was a conservative treatment; he proposed no new species and attempted to recognize morphogeographic elements within some of the more widespread species, calling these subspecies. He provided a detailed key to the various taxa, according to continent. In North America (including Central America and the West Indies) he recognized fourteen species, several of these with infraspecific taxa. Unfortunately, some of the more widespread elements of this complex were inadequately typified, as noted by Lourteig (1979) in her comprehensive taxonomic account of sect. *Corniculatae* for extra South American elements. In this ambitious treatment she recognized twelve species as native to North America, providing a nearly complete synonymy with detailed citation of specimens documenting distribution. In terms of nomenclature, her major contribution was that of the typification of *O. stricta* L. vis-a-vis *O. corniculata* and *O. dillenii*, a subject touched upon in some detail much earlier by Eiten (1955).

My interest in all of the above has to do with the names applicable to populations of *Oxalis corniculata* in México and Texas, especially the latter. Both Eiten and Lourteig used subspecific categories for their major morphogeographical elements within this species. Eiten, however, regarded *O. corniculata* as largely an Old World element, albeit "A universal weed in all inhabited regions except the Arctic." Adding "In that part of North America which is north of Mexico in the west, and north of the immediately Gulf Coast in the east, the species is apparently confined to gardens, lawns and greenhouses." For those elements of *O. corniculata* (sensu Lourteig 1979) he took up the name *O. albicans* H.B.K.; for most of the central and eastern U.S.A. material of this complex he took up the names *O. dillenii* and *O. stricta*.

Lourteig, hopefully after resolving problems in typification, recognized *Oxalis corniculata* as a largely pantropical element, lectotypified by an Old World collection made by Thunberg (Lourteig 1979, p. 60). Consequently, in her treatment, while maintaining most of the taxa accepted by Eiten, she modified the nomenclature to reflect her study. Within the *O. corniculata* complex touched upon by Eiten, this included: 1) recognition of *Oxalis corniculata* as native to North America; 2) elevation of *O. albicans* subsp. *californica* (Abrams) Eiten to specific rank (as was earlier accorded the taxon by other

workers); 3) recognition of *O. albicans* subsp. *pilosa* (Nutt. ex Torr. & Gray) Eiten as a subsp. of *O. corniculata*; 4) recognition of *O. albicans* subsp. *albicans* as a subsp. of *O. corniculata*; and 5) *O. dillenii* Jacq. as a synonym of *O. stricta* (which will not further concern us here).

As might be inferred from the above, if one accepts Lourteig's concept of *Oxalis corniculata* as a worldwide largely pantropical species, there appear to be 2 or 3 infraspecific elements in North America: 1) subsp. *corniculata*, a poorly defined element having mostly purely yellow petals said by Lourteig to occur throughout much of temperate North America (perhaps where introduced, but not so indicated by Lourteig), but more so throughout México and Central America; 2) subsp. *albicans*, which is typified by material from the west coast of central México and said to differ from subsp. *corniculata* (with which it is sympatric) in possessing orangish-yellow petals and a thicker more ligneous tap-root, which seems to be the case, but certainly many of the citations of subsp. *corniculata* given by Lourteig in her treatment (e.g., TEXAS: Bejar Co., *Berlandier* 152, 1810 [F]; and Hidalgo Co., *Painter & Barkley* 14470 [TEX!]) must reflect ignorance as to flower color or else these are atypical elements of her subsp. *albicans*; and 3) subsp. *pilosa*, said to be a relatively localized taxon of the drier regions of northcentral México and closely adjacent U.S.A. (with what appear to be a few misidentifications from more remote areas pitched in), typified by material from southern California.

Lourteig has provided an informative Figure 6 illustrating representative plants of subsp. *albicans* and subsp. *pilosa*, and the characters enumerated by her in key and description form appear to be diagnostic, as a *syndrome*. I emphasize the latter because in my examination of 500 or more sheets of this complex from México and adjacent U.S.A., exceptions to this or that character state are found in individuals and/or populations throughout the region concerned. Nevertheless, I do find regional validity of those two complexes as morphogeographical intergrading entities deserving of nomenclatural recognition, but at the varietal level, which is in keeping with at least most current practice in North America, if not elsewhere. Because of this I find it expedient to propose the following new combinations for the North American elements of *Oxalis corniculata*:

OXALIS CORNICULATA L. var. **WRIGHTII** (A. Gray) B.L. Turner, *comb. nov.* BASIONYM: *Oxalis wrightii* A. Gray, *Pl. Wright.* 1:27. 1852.

This taxon is typified by material collected by Charles Wright, probably in New Mexico (GH!). Its salient features are well depicted in Figure 6a of Lourteig (as subsp. *albicans*). Lourteig took up the subspecific name *albicans* for this taxon, but its earliest name at the varietal level occurred when *Oxalis*

wrightii A. Gray var. *pilosa* (Nutt. ex Torr. & Gray) Wiegand was first proposed in 1925, the varietal epithet *wrightii* being automatically formed at that time under the current *International Code of Botanical Nomenclature*. The general distribution of var. *wrightii* vis-a-vis var. *pilosa* is shown in Figure 1. As will be noted, I view var. *wrightii* as mostly a taxon of the central U.S.A., intergrading at about the Mexican border into the more widespread, more variable var. *pilosa*.

It should be noted that many current authors apparently have recognized two species from among my concept of *Oxalis corniculata* var. *wrightii*. McGregor (1979) in his treatment of *Oxalis* for the Great Plains Flora recognized two sympatric species within the *O. corniculata* complex, *O. dillenii* Jacq. and *O. stricta* L. He did not recognize *O. corniculata*, but the latter two taxa apparently both apply to what I have called *O. corniculata* var. *wrightii*. He distinguished *O. stricta* by pubescence type, largely following the work of Eiten (1963). I could also have recognized two such names but, at least in Texas, these appear to be but pubescence forms of a single taxon which I have called *O. c.* var. *wrightii*, following the biology of Lourteig (1979), who typifies and restricted *O. stricta* to the more eastern portions of the U.S.A., extending westward to about the easternmost limits of *O. c.* var. *wrightii*.

OXALIS CORNICULATA L. var. PILOSA (Nutt. ex Torr. & Gray) B.L.
Turner, *comb. nov.*, **BASIONYM:** *Oxalis pilosa* Nutt. ex Torr. & Gray,
Fl. N. Amer. 1:212. 1838.

This taxon is typified by material collected by Nuttall in California. Its salient features are depicted in Figure 6b of Lourteig (as subsp. *pilosa*). Lourteig took up the subspecific name *pilosa* for this taxon but its earliest name at the varietal level occurred autonymically with the combination *O. pilosa* var. *subpilosa* (Wiegand) Wiegand, first proposed in 1926, heterotypic with var. *pilosa*.

The following key to these two North American varietal taxa should help identify typical elements of each. I cannot distinguish Lourteig's subsp. *pilosa* from her subsp. *albicans* in México and have applied the name var. *pilosa* to nearly all of the specimens in this region (Figure 2), including specimens she cites as subsp. *corniculata* (although probable but occasional introduced elements of the latter need not be denied).

1. Sepals mostly 2.5-3.5 mm long, rather evenly pubescent throughout; apices of sepals mostly obtuse or rounded, weakly tufted if at all; peduncles with mostly appressed hairs; stems erect, arising from slender rhizomes; central U.S.A. to the Mexican border (Figure 1). var. *wrightii*

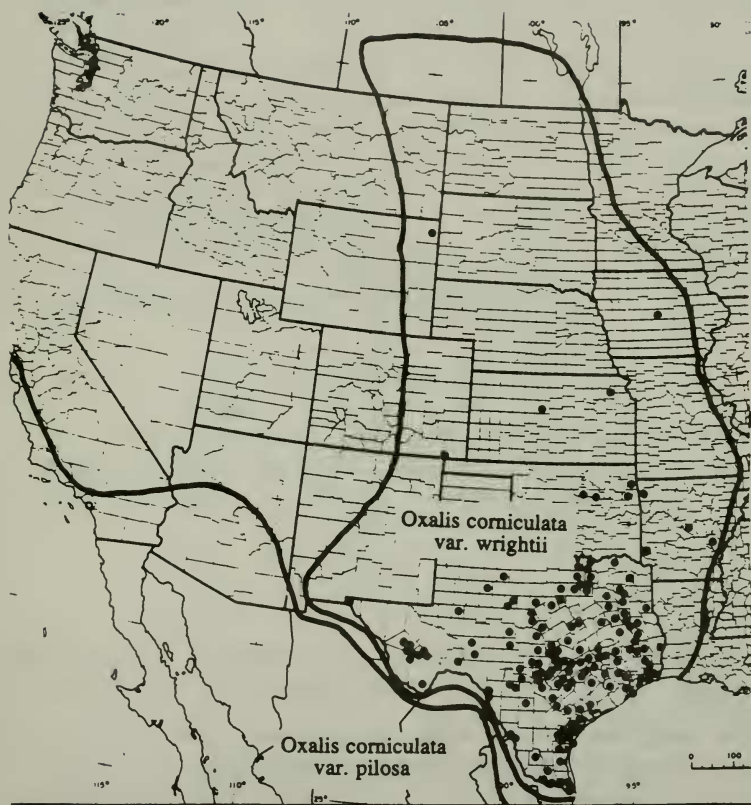


Figure 1. Approximate distribution of *Oxalis corniculata* var. *wrightii* in North America. Circles indicate collections of this taxon annotated and on file at LL, TEX. This variety intergrades into var. *pilosa* along a band of about 200 km along the U.S.A.-México border, mainly in México.



Figure 2. Distribution of *Oxalis corniculata* var. *pilosa* in México (open circles), var. *wrightii* (closed circles), and \pm intermediates (half-shaded circles). Annotated specimens vouchering this distribution are on file at LL, TEX.

1. Sepals mostly 3.5-6.0 mm long, partially glabrate or unevenly pubescent; apices of sepals mostly acute, tufted; peduncles with mostly spreading hairs; stems usually procumbent, arising from ligneous thickened root-stocks, or not; western U.S.A. and throughout México. var. *pilosa*

It should be reiterated that the several characters (from among a syndrome) listed in the above key are quite variable and each is much prone to environmental modification as well as genetic perturbation. Considering the exceptional variability of the *Oxalis corniculata* species complex one might well ask the question: need infraspecific taxa be recognized at all? Perhaps not, but where morphogeographical elements seem reasonably well defined, as in the case of var. *wrightii*, I see no good reason not to. Perhaps future workers with more field work will be able to subdivide *O. corniculata* (s.l.) into meaningful infraspecific groupings with more certainty.

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